REMARKS

In the last Office Action, the Examiner withdrew claims 3-35 from further consideration as being directed to a non-elected invention. Claims 1 and 2 were objected to as containing informalities. Claims 1-2 were rejected under 35 U.S.C. §102(e) as being anticipated by U.S. Patent No. 6,487,148 to Hsieh. Additional art was cited of interest.

In accordance with the present response, the specification has been suitably revised to correct informalities and bring it into better conformance with U.S. practice. The specification has been further revised to provide a cross-reference to copending International Application Ser. No. PCT/JP99/05725, filed October 15, 1999. Original claims 1-2 have been replaced with new claims 36-52 to further patentably distinguish from the prior art of record, overcome the objection and improve the wording in the original claims, bring the claims into better conformance with U.S. practice, and provide a fuller scope of coverage. Non-elected claims 3-35 have been canceled without prejudice or admission and subject to applicants' right to file a continuing application to pursue the subject matter of the non-elected claims. The title of the invention has been changed to "INFORMATION REPRODUCING APPARATUS AND INFORMATION REPRODUCING METHOD" to more clearly reflect the invention to which the new claims are directed. A new, more

descriptive abstract has been substituted for the original abstract.

Applicants respectfully request reconsideration of their application in light of the following discussion.

Brief Summary of the Invention

The present invention is directed to an information reproducing apparatus and to an information reproducing method.

Conventional information reproducing apparatuses which reproduce information from a medium utilizing near-field light are known. However, as described in the specification (pgs. 1-3), the conventional information reproducing apparatuses have not been able to provide high-density reproduction of information.

The present invention overcomes the drawback of the conventional art. Figs. 1-4 show an embodiment of an information reproducing apparatus according to the present invention embodied in the claims. The information reproducing apparatus has a light source 102 for generating linearly polarized light and a medium 101 having a linear mark 7. An optical head 104 is disposed between the light source 102 and the medium 10 and has a fine aperture 103. The light source 102 includes a polarized light control portion for controlling the linearly polarized light generated by the light source 102

to pass through the fine aperture 103 of the optical head 104 to generate near-field light having a preselected polarization direction and to irradiate the linear mark 7 of the medium 101 with the near-field light so that the preselected polarization direction of the near-field light is orthogonal to a longitudinal axis of the linear mark 7. A detector 105 detects light scattered by the linear mark 7 irradiated with the near-field light.

By the foregoing construction, the present invention provides a high-density information reproducing apparatus. More specifically, in the information reproducing apparatus of the present invention, the light scattered by the linear mark of the medium has a high intensity because the near-field light irradiated on the linear mark has a polarization direction which is orthogonal to a longitudinal axis of the linear mark. A signal corresponding to the high-intensity scattered light can then be processed to obtain highly accurate reproduction information.

The prior art of record does not disclose or suggest the subject matter recited in newly added claims 36-52.

New independent claim 36 is directed to an information reproducing apparatus and requires a light source for generating linearly polarized light, a medium having a linear mark, an optical head disposed between the light source and the medium, the optical head having a fine aperture,

polarized light control means for controlling the linearly polarized light generated by the light source to pass through the fine aperture of the optical head to generate near-field light having a preselected polarization direction and to irradiate the linear mark of the medium with the near-field light so that the preselected polarization direction of the near-field light is orthogonal to a longitudinal axis of the linear mark, and a detector for detecting light scattered by the linear mark irradiated with the near-field light.

The prior art of record does not disclose or suggest the structural and functional combination of the information reproducing apparatus recited in independent claim 37. For example, Hsieh discloses an edge detection system for detecting pre-formatted marks on a disk surface (Fig. 1). A laser 100 generates an optical beam. An optical head 103 has a near-field lens 106 which receives and focuses the optical beam onto an edge 118 of a pre-formatted mark 112 on the surface the disk 110. Hsieh also discloses that a solid immersion mirror, a tapered optical fiber, or a flying diode laser may be used in place of the near-field lens 106 to provide the near-field light.

However, Hsieh does not disclose or suggest an optical head disposed between the light source and the medium and having a fine aperture for receiving linearly polarized light and generating near-field light, as recited in claim 36.

There is no teaching or suggestion that the near-field lens 106, the solid immersion mirror, the tapered optical fiber and/or the flying diode laser disclosed by Hsieh has a fine aperture for receiving linearly polarized light and generating near-field light, as recited in claim 36.

Moreover, Hsieh does not disclose or suggest polarized light control means for controlling the linearly polarized light generated by the light source to pass through the fine aperture of the optical head to generate near-field light having a preselected polarization direction and to irradiate the linear mark of the medium with the near-field light so that the preselected polarization direction of the near-field light is orthogonal to a longitudinal axis of the linear mark, as recited in claim 36. While the edge 118 of the pre-formatted mark 112 is irradiated with near-field light, Hsieh does not disclose or suggest that a polarization direction of the near-field light is orthogonal to a longitudinal axis of the mark, as recited in claim 36.

By providing polarized light control means for irradiating the linear mark of the medium with the near-field light so that the preselected polarization direction of the near-field light is orthogonal to a longitudinal axis of the linear mark, light scattered by the linear mark of the medium has an intensity which is sufficiently high to permit high-density reproduction of information. In this regard, the

disclosure in Hsieh deals only with the detection of servo signals (i.e., tracking error and read-only signals) and does deal at all with the high-density reproduction of information.

New independent claim 45 also patentably distinguishes from the prior art of record. Claim 45 is directed to an information reproducing apparatus and requires a medium having at least one linear mark, an optical head disposed over the medium and having a fine aperture, and light generating means for generating linearly polarized light, directing the linearly polarized light through the fine aperture of the optical head to generate near-field light and to irradiate the linear mark of the medium with the near-field light, and controlling a direction of polarization of the near-field light so that the direction of polarization of the near-field light irradiated on the linear mark is orthogonal to a longitudinal axis of the linear mark. Hsieh does not disclose or suggest the structural and functional combination of the information reproducing apparatus recited in claim 45 as set forth above for independent claim 36.

New independent claim 41 is also directed to an information reproducing apparatus and requires a light source for generating linearly polarized light, a medium having a plurality of linear marks extending in different directions from one another, and an optical head disposed between the light source and the medium, the optical head having a fine

aperture. Claim 41 further requires polarized light control means for controlling the linearly polarized light generated by the light source to pass through the fine aperture of the optical head to generate near-field light having a preselected polarization direction and to irradiate the linear marks of the medium with the near-field light, and a detector for detecting light scattered by the linear marks irradiated with the near-field light. No corresponding structural and functional combination is disclosed or suggested by the prior art of record. For example, Hsieh does not disclose or suggest a medium having a plurality of linear marks extending in different directions from one another, and polarized light control means for irradiating the linear marks of the medium with near-field light, as recited in claim 41.

New independent claim 49 is directed to an information reproducing method and requires the steps of providing a medium having a linear mark, generating near-field light by directing linearly polarized light through a fine aperture of an optical head, irradiating the linear mark on the medium with the near-field light while controlling a direction of polarization of the near-field light so that the direction of polarization of the near-field light irradiated on the linear mark is orthogonal to a longitudinal axis of the linear mark, and detecting light scattered by the linear mark irradiated with the near-field light. No corresponding

combination of steps is disclosed or suggested by Hsieh as set forth above for independent claim 36.

Claims 37-40, 42-44, 46-48 and 50-52 depend on and contain all of the limitations of independent claims 36, 41, 45 and 49, respectively, and, therefore, distinguish from the references at least in the same manner as claims 36, 41, 45 and 49.

In view of the foregoing amendments and discussion, the application is believed to be in allowable form. Accordingly, favorable reconsideration and allowance of the claims are most respectfully requested.

Respectfully submitted,

ADAMS & WILKS
Attorneys for Applicants

By: _____
Bruce L. Adams
Reg. No. 25,386

50 Broadway
31st Floor
New York, NY 10004
(212) 809-3700

MAILING CERTIFICATE

I hereby certify that this correspondence is being deposited with the United States Postal Service as first-class mail in an envelope addressed to: MS NON-FEE AMENDMENT, COMMISSIONER FOR PATENTS, P.O. Box 1450, Alexandria, VA 22313-1450, on the date indicated below.

Franco S. De Liquori
Name

_____
Signature

September 17, 2004
Date